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JACOBSON & JOHNSON
ONE WEST WATER STREET, SUITE 285
ST. PAUL, MN 55107

EXAMINER	
DUPUIS, DEREK L	
ART UNIT	**PAPER NUMBER**
2883	

DATE MAILED: 10/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/812,800	STEVENS, RICK C.	
	Examiner	Art Unit	
	Derek L. Dupuis	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 August 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 8/15/2006 have been fully considered but they are not persuasive.

2. In pages 2 and 3, applicant argues that the overall unit disclosed by Takahashi's figure 2 and 4 is not an optical coupler. The examiner respectfully disagrees. An optical coupler is any device that couples and optical signal from one light transmission means to another. In figures 3 and 4, light is being coupled between two fibers. While the light signal is also attenuated, the signal is nevertheless coupled. The fact that the device is an attenuator does not mean that it is not a coupler. Optical couplers come in many forms that all perform difference functions on the signals that they couple. Examples include optical attenuators, arrayed waveguide gratings, optical diffraction gratings, optical modulators and more. So long as a signal is passed from one transmission means to another, it is by definition an optical coupler.

3. In pages 3 and 4, applicant argues that Takahashi does not teach that the two fibers are proximate one another. The word proximate, as defined in the American Heritage Dictionary, means "very near". The two fibers in the ferrules are very near to each other. In fact, as shown in figure 3, at least one configuration of the coupler has the two fibers adjacent to one another.

4. In pages 4 and 5, applicant argues that Takahashi does not permit transfer of an optical signal while the fibers are being rotated. The examiner disagrees. The optical fibers are connected to an optical source and a powermeter (see column 5, lines 56-59). The source sends an optical signal and the powermeter detects the received optical signal. The fibers are then rotated to achieve a desired attenuation. This attenuation is measured by the powermeter. For

the attenuation to be measured, there must be a signal present to be measured. The adhesive is applied only after the fibers are rotated to result in the desired amount of attenuation.

5. In pages 5 and 6, applicant argues that the flanged members do not hold optical fibers. The examiner disagrees. The flanged members hold both the ferrules which hold the optical fibers. Therefore, the flanged members are "holding" the fibers. While the fibers are not in direct contact the flanged members, they are being supported by the flanged members. The American Heritage Dictionary defines "hold" to mean "supporting" or "directing".

6. In page 6, applicant argues that the U-shaped members do not hold the flanged members in rotational engagement. The examiner respectfully disagrees. The U shaped members are screwed on over the flanged members to hold the flanged members in place. The flanged members are engaged in a rotational position and are secured in a such a position by the U-shaped members.

7. In page 7, applicant argues that the device shown by Jones is not a single optical coupler. The examiner disagrees. Claim 1 does not call for a single coupler. On the contrary, dependent claim 4 calls for a "second coupler". Even if claim 1 did call for a single coupler, then claim 4 would directly contract this and would result in a rejection under 112, second paragraph for being indefinite.

8. In pages 7 and 8, applicant argues that a signal is not permitted to be transferred between the optical fibers. The examiner disagrees. The device is an optical attenuator. The signal strength is reduced by the loss introduced by the misalignement, but the signal is never-the-less coupled between the fibers.

9. In pages 8 and 9, applicant argues that Jones does not teach a second coupler in the alignment sleeve. The examiner respectfully disagrees. Jones teaches a first coupler (between 61 and 62) and a second coupler (between 62 and 63) within an alignment sleeve (105).

10. In pages 10 and 14, applicant argues that the fiber in Takahashi does not have an angle cut terminus. The examiner agrees that an angle cut terminus is not explicitly stated. However, the examiner disagrees with applicant's assertion that this is not an obvious limitation. The examiner has explained this in the previous office action. Further support is Takahashi's teaching that the ferrule edge is finished by polishing the ferrule surface at seven to eight degrees. This results in a reduction in the optical power loss due to the reflection at the interfaces of the device. See column 7, lines 16-34. This suggestion by Takahashi to angle the optical interface is another suggestion to angle the optical fiber edges. Applicant's arguments have been statements as to why the device might not have angled fibers. These arguments are not such that a modification to angle the fibers would not have been obvious.

11. In page 11, applicant argues that Takahashi does not teach a rotational joint on the first fiber. The examiner respectfully disagrees, as discussed in the reference and in the prior office action, Takahashi teaches that the fiber can be rotated 180 degrees about its axis. Applicant argues that rotating around an optical axis of the first ferule is different from actually rotating about the first ferrule. This argument is confusing because at no point does applicant claim an optical fiber rotating about the first ferrule.

12. In page 12, applicant argues that the adapter of Takahashi does not support the optical fibers. The examiner respectfully disagrees. The adapter (59) supports many elements of the device including the ferrules and the fibers within the ferrules.

13. In page 12, applicant argues that Figure 3 does not show a cylinder having a rotational butt coupled joint in an optical lead. Figure 3 shows the two cylinders (41 and 42) being flushed against one another at the interface. By definition this is butt-coupling.

14. In page 13, applicant argues that Takahashi in view of Snow do not teach optical fibers having a butt connectable end. The examiner disagrees. Figure 3 shows the two cylinders (41 and 42) being flushed against one another at the interface. By definition this is butt-coupling.

15. The rejections stand and have been repeated below. This rejection is FINAL.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> or
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

17. Claims 1, 3, 5-7, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by ***Takabashi (US 5,136,681)***.

18. Regarding independent claim 1, Takabashi teaches an optical coupler shown best in figure 3. The coupler comprises a first optical fiber (33) in a ferrule (41). A second optical fiber (34) is rotatably mounted with respect to the first optical fiber (33) with the end of the first optical fiber proximate an end of the second optical fiber (see column 5, lines 64-68) to permit

transfer of an optical signal between the fibers (see column 4, lines 44-50) while permitting rotation thereof (see column 5, lines 64-68 and column 6, lines 15-31).

19. Regarding claims 3 and 5, Takabashi teaches an optical coupler as discussed above in reference to claim 1. The coupler includes an alignment sleeve (59) (see column 4, lines 56-58) mounted on the coupler with an alignment guide (55 and 56 wherein the threads are used as guides).

20. Regarding claim 6, Takabashi teaches an optical coupler as discussed above in reference to claim 1. The coupler includes a flanged member (51) holding the first optical fiber (33) and a second flanged member (52) holding the second optical fiber (34).

21. Regarding claim 7, Takabashi teaches an optical coupler as discussed above in reference to claim 6. A U-shaped member (57 and 58) holds the first and second flanged members in rotational engagement with each other.

22. Regarding claim 9, Takabashi teaches an optical coupler as discussed above in reference to claim 1. As shown in figure 3, the fibers can be butted up against one another with no distance between the fiber.

23. Claims 1-5 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by ***Jones et al (US 2004/0096178 A1)***.

24. Regarding independent claim 1, Jones et al teach an optical coupler shown best in figure 6 comprising a first optical fiber within a ferrule (61) and a second optical fiber in a ferrule (62). Jones et al teach that the ferrule bores hold optical fibers (see second paragraph of the abstract). Hereinafter, the reference numbers of the ferrules will be used to reference the ferrules and the optical fibers contained therein. The second optical fiber (62) is rotatably mounted with respect

to the first optical fiber (61) with an end of the first optical fiber positioned proximate an end of the second optical fiber as seen in figure 6 (see paragraph 37). An optical signal is transferred between the first and second fibers (see paragraphs 8 and 9) while permitting rotation of the second optical fiber (see paragraphs 37-39).

25. Regarding claim 2, Jones et al teach an optical coupler as discussed above in reference to claim 1. The coupler includes an optical conducing substance (108) having an index of refraction matching an index of refraction of the first and second optical fibers (see paragraph 37). The substance is located proximate the ends of the first and second fibers as seen in figure 6.

26. Regarding claim 3, Jones et al teach an optical coupler as discussed above in reference to claim 1. The coupler includes an alignment sleeve (105) mounted on the coupler.

27. Regarding claim 4, Jones et al teach an optical coupler as discussed above in reference to claim 3. A second optical coupler is located in the alignment sleeve (105). The second coupling is between the second fiber (62) and a third fiber (63). An index matching substance (108) is located between the ends of the fibers as seen in figure 6.

28. Regarding claim 5, Jones et al teach an optical coupler as discussed above in reference to claim 1. An alignment guide (88) is located on the coupler.

29. Regarding claim 9, Jones et al teach an optical coupler as discussed above in reference to claim 1. The first and second fiber ends are butt connected as shown in figure 6.

Claim Rejections - 35 USC § 103

30. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

31. Claims 8, 10-13, 16, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Takahashi (US 5,136,681)***.

32. Regarding claims 8 and 10, Takabashi teaches an optical coupler as discussed above in reference to claim 1. Takabashi teaches that the ferrules (41 and 42) which hold the first and second fibers (33 and 34) have angle cut faces (35, 36) (see column 6, lines 15-37). While the reference does not explicitly show a fiber having an angle cut terminus, fibers (33 and 34) are understood to be in the ferrules (41 and 42) to permit the transmission discussed above and it would be obvious to one of ordinary skill in the art that the fibers would have an end face similar to that of the ferrules. A ferrule holds a fiber in its center bore. The fiber is inserted into a ferrule and the fiber extends through the ferrule and terminates at the end face of the ferrule. The end of the fiber is generally flush with the end face of the ferrule. When the ferrule end face is polished or cut, the fiber also undergoes the same treatment since the end face of the fiber is in the same plane as the end face of the ferrule. While this is not explicitly stated in the reference, this is understood because it is commonly known and routinely used in the art of optical fibers.

33. Regarding independent claim 11, Takabashi teaches an apparatus for optical coupling shown best in figure 3. The coupler comprises a first optical fiber (34) in a ferrule (42) with an angle cut terminus. The device includes a rotational joint on the first fiber (34) (see column 5, 64-68). A second optical fiber (33) is located in a second ferrule (41) having an angle cut terminus. The angle cut terminus edges of the ferrules are positioned such that the optical fibers (33 and 34) can transmit light therebetween (see column 4, lines 44-50). The angled surfaces

minimize back reflections of light (see column 7, lines 16-21). The device also includes an alignment sleeve (59) for holding the ends of the fibers in rotational alignment with respect to each other. While the reference does not explicitly show a fiber having an angle cut terminus, fibers (33 and 34) are understood to be in the ferrules (41 and 42) to permit the transmission discussed above and it would be obvious to one of ordinary skill in the art that the fibers would have an end face similar to that of the ferrules. A ferrule holds a fiber in its center bore. The fiber is inserted into a ferrule and the fiber extends through the ferrule and terminates at the end face of the ferrule. The end of the fiber is generally flush with the end face of the ferrule. When the ferrule end face is polished or cut, the fiber also undergoes the same treatment since the end face of the fiber is in the same plane as the end face of the ferrule. While this is not explicitly stated in the reference, this is understood because it is commonly known and routinely used in the art of optical fibers.

34. Regarding claim 12, Takabashi teaches a device for optical coupling as discussed above in reference to claim 11. Takabashi teaches that the rotational joint includes an alignment guide (56 wherein the threads are used as guides).

35. Regarding claim 13, Takabashi teaches a device for optical coupling as discussed above in reference to claim 11. As shown in figure 3, the fiber ends can be butt connectable at the ends.

36. Regarding independent claim 16, Takabashi teaches a method of twist free optical coupling comprising forming a rotational butt coupled joint in an optical lead (34) having a terminus (35) (see column 5, lines 64-68). A coupling face (35) is located on the terminus of the optical lead (34). A mating coupling face is formed on the terminus (36) of a second optical lead

(33). The first optical lead (34) coupling face is rotationally aligned with the coupling face of the second optical lead (33) to thereby transmit an optical signal therebetween (see column 4, lines 44-50). The maximum rotation of the optical lead (34) is 180 degrees which limits twisting of the optical lead (34). The angle cut faces (35 and 36) minimize back reflections (see column 6, lines 15-37 and column 7, lines 14-21). While the reference does not explicitly show a fiber having an angle cut terminus, fibers (33 and 34) are understood to be in the ferrules (41 and 42) to permit the transmission discussed above and it would be obvious to one of ordinary skill in the art that the fibers would have an end face similar to that of the ferrules. A ferrule holds a fiber in its center bore. The fiber is inserted into a ferrule and the fiber extends through the ferrule and terminates at the end face of the ferrule. The end of the fiber is generally flush with the end face of the ferrule. When the ferrule end face is polished or cut, the fiber also undergoes the same treatment since the end face of the fiber is in the same plane as the end face of the ferrule. While this is not explicitly stated in the reference, this is understood because it is commonly known and routinely used in the art of optical fibers.

37. Regarding claims 18-20, Takabashi teaches a method as discussed above in reference to claim 16. An alignment sleeve (59) is used to rotationally align the coupling angle cut face of the first optical lead and the second optical lead as shown in figures 3 and 4 (see column 4, lines 56-58). An alignment guide (55 and 56) is used to align the coupling faces of the optical leads (33 and 34). A rotational joint is also located on the second optical fiber (33) (see column 5, lines 1-17).

38. Claims 2, 14, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Takahashi (US 5,136,681)*** as applied to claims 1, 3, 5-13, 16, and 18-20 above, and further in view of ***Snow et al (US 5,039,193)***.

39. Regarding claims 2, 14, and 17, Takahashi et al teach an optical coupler, a device for optical coupling, and a method of optical coupling as discussed above in reference to claims 1, 11, and 16 respectively. Takahashi does not explicitly teach an optical conducting substance having an index of refraction matching an index of refraction of the first optical fiber/lead and the second optical fiber/lead located proximate the end of the first optical fiber and the end of the second optical fiber or proximate the butt connectable end in the rotational joint or in the butt coupled joint. In other words, adding an index-matched fluid between the end of ferrules 41 and 42.

40. Snow et al teach the use of an optical conducting substance having an index of refraction matching an index of refraction of optical fibers in a rotating joint (column 2, lines 17-19).

41. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the invention of Takabashi and include an optical conducting substance having an index of refraction matching the index of refraction of the first and second optical fibers proximate the end of the first and second fibers or proximate the butt connectable end in the rotational joint.

42. The motivation is to improve return losses (column 2, lines 17-19). In other words, the index-matching fluid improves return losses by reducing reflections that normally occur at glass-air boundaries.

43. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over ***Takahashi (US 5,136,681)*** in view of ***Snow et al (US 5,039,193)***.

44. Regarding independent claim 15, Takabashi teaches an apparatus for optical coupling and decoupling as shown in figures 3 and 4. The device includes a first optical lead (33) having a butt connectable end. A first ferrule (41) holds the first optical lead (33). A second optical lead (34) has a butt connectable end and is held in a second ferrule (42). The second ferrule (42) holds the second lead (34) in rotational relationship with respect to the first optical lead (33) (see column 5, lines 64-68). The first and second ferrules (41 and 42) each have an angle cut terminus to allow passage of an optical signal through the end face (see column 4, lines 44-50).

45. While the reference does not explicitly show a fiber having an angle cut terminus, fibers (33 and 34) are understood to be in the ferrules (41 and 42) to permit the transmission discussed above and it would be obvious to one of ordinary skill in the art that the fibers would have an end face similar to that of the ferrules. A ferrule holds a fiber in its center bore. The fiber is inserted into a ferrule and the fiber extends through the ferrule and terminates at the end face of the ferrule. The end of the fiber is generally flush with the end face of the ferrule. When the ferrule end face is polished or cut, the fiber also undergoes the same treatment since the end face of the fiber is in the same plane as the end face of the ferrule. While this is not explicitly stated in the reference, this is understood because it is commonly known and routinely used in the art of optical fibers.

46. Takahashi does not explicitly teach a transparent substance extending between the butt connectable end of the first lead and the second lead having an index of refraction matching an index of refraction of the first optical lead and the second optical lead to thereby inhibit loss of an optical signal therebetween while permitting rotation thereof. In other words, adding an index-matched fluid between the end of ferrules 41 and 42.

47. Snow et al teach the use of an optical conducting substance having an index of refraction matching an index of refraction of optical fibers in a rotating joint (column 2, lines 17-19).

48. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the invention of Takabashi and include a transparent substance having an index of refraction matching the index of refraction of the first and second optical leads proximate the butt connectable end of the first and second leads to thereby inhibit loss of an optical signal therebetween while permitting rotation thereof.

49. The motivation is to improve return losses (column 2, lines 17-19). In other words, the index-matching fluid improves return losses by reducing reflections that normally occur at glass-air boundaries.

Conclusion

50. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek L. Dupuis whose telephone number is (571) 272-3101. The examiner can normally be reached on Monday - Friday 8:30am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Derek L. Dupuis
Group Art Unit 2883

Frank G. Font
Supervisory Patent Examiner
Technology Center 2800